## REMARKS

Claims 18-21, 23, and 31 are pending. Claims 18-21, 23, and 31 have been rejected under 35 U.S.C. §103. Claims 18 and 31 have been amended. Support for the amendments to these claims is found at least in paragraphs 16, 26, 49, and 51 of the substitute specification and in Figures 1-3. Claims 1-17, 22, and 24-30 have been cancelled in previous correspondence with the Patent Office. Claims 18-21, 23, and 31 remain for consideration upon entry of the present Amendment. No new matter has been added.

Claims 18-21, 23, and 31 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,149,738 to Dahlback (hereinafter "Dahlback") in view of U.S. Patent No. 6,167,104 to Garzarolli et al. (hereinafter "Garzarolli"). The Examiner alleges that Dahlback discloses the method of producing and treating the sheet for a component in a fuel assembly for a nuclear light water reactor comprising the steps recited in claims 18 and 31. The Examiner also notes that Dahlback does not disclose that the sheet is stretched to the same extent or in the same manner defined in claims 18 and 31. The Examiner then alleges that Dahlback discloses the restoration of the flatness of the sheet during heat treatment and that Garzarolli discloses the lengthening of a tube during a straightening operation by stretching the tube by at least 0.3% of the initial length of the tube in the longitudinal direction such that the stretching amount range of Garzarolli overlaps the ranges as recited in claims 18 and 31, thereby providing the basis for a prima facie case of obviousness.

Applicants would like to point out that there are essentially two kinds of modern light water reactors, namely, boiling water reactors (BWR) and pressurized water reactors (PWR). Substantially different conditions exist with regard to the operations of each type, particularly with respect to conditions relative to corrosion. As such, the components used in the different reactors and the treatments of the components are usually different in order to adapt the components to the kind of reactor used and in response to differing corrosion environments. Also, the fuel assemblies used in these kinds of reactors are also substantially different. For example, a fuel assembly for a PWR normally has guide tubes for control rods, while a fuel assembly for a BWR does not have any such guide tubes (in a BWR control rods are usually inserted between the fuel assemblies). Because of the different conditions that exist in a PWR versus a BWR, a component used for one kind of reactor is normally not

adapted to be used in the other kind of reactor. Further to the foregoing, Applicants point out that claims 18 and 31 have been amended to clarify that the present invention is directed to a method for producing and treating a sheet for a component in a BWR.

With regard to the Examiner's rejections based on §103, Dahlback discloses a fuel box and a method for manufacturing zirconium alloy plates for fuel boxes. The method includes a heat treatment method in which the plates are beta quenched. According to the reference, it appears that the ductility of the material of the plates is not deteriorated by this treatment. (Dahlback, column 2, lines 57-65.) In the method, a finely lamellar basketweave structure is favorable for carrying out the bending of the plates in order to avoid cracking. (Dahlback, column 3, lines 1-3.) In manufacturing the material for the plates, alloying elements are added to zirconium to form a zirconium alloy ingot. The manufactured ingot is forged in the beta-phase region. (Dahlback, column 5, lines 1-4.) The forging is reduced by hot rolling, and the temperature during this step is kept to a minimum. Thereafter, the material is cold-rolled in a number of steps down to the finished dimension. The material is then beta quenched in an effort to improve corrosion properties and ductility. A heat treatment using infrared lamps is then performed. The resulting plate material exhibits a microstructure that is characterized by the finely lamellar basketweave structure. (Dahlback, column 5, lines 15-40.)

Dahlback fails to disclose, teach, or suggest stretching the sheet during the heat treating of the sheet in the alpha phase temperature range of the alloy, as recited in claim 18 and also in claim 31. The Examiner has previously admitted in the Office Action of October 26, 2007 (and elsewhere) that Dahlback does not disclose that the sheet is stretched during the heat treatment, whereas claims 18 and 31 clearly recite that the sheet is stretched during the heat treatment in the alpha-phase region.

Garzarolli discloses a pressurized water reactor fuel assembly having a guide tube. Also disclosed is a method for producing a guide tube for control elements. The guide tubes are composed of zirconium alloys and show sharp radiation-induced growth in the axial direction at the start of their use in a reactor core. This sharp initial growth is compensated for by an inherent contraction of the tubes. For this purpose, the tubes are given internal stresses which are reduced by the tube contraction as a result of supplied energy. These internal stresses are generated such that the tube is lengthened during a straightening operation in a last production step of the tube. Some guide tubes are subsequently lengthened

by at least 0.3%, and preferably at least approximately 0.4% to 0.5% of the length of the initial tube. Garzarolli explains that the lengthening concludes the production of the tubes (Garzarolli, column 4, lines 32-35). Moreover, Garzarolli suggests the use of a straightening bench (Garzarolli, column 2, lines 8-16, and column 4, lines 46-64).

Garzarolli also fails to disclose, teach, or suggest stretching the sheet during heat treatment of the sheet in the α-phase temperature range of the alloy, as recited in claim 18 and also in claim 31. The lengthening of the tube in Garzarolli is such that the tube is lengthened by at least 0.3%, but this lengthening process is achieved using a different process than that recited in the claims of the present application. In particular, Garzarolli (column 3, lines 30-58) discloses that the guide tubes are textured, and that this texture is responsible for the axial growth of the guide tubes. Claims 18 and 31, on the other hand, recite no such step of texturing. Therefore, Garzarolli fails to disclose, teach, or suggest stretching the sheet during heat treatment, as recited in claims 18 and 31.

Because neither Dahlback nor Garzarolli individually disclose, teach, or suggest the same element (namely, stretching the sheet during heat treatment of the sheet in the α-phase temperature range of the alloy, as recited in claim 18 and also in claim 31), any combination thereof would also necessarily fail to disclose, teach, or suggest such an element. More specifically, any combination of Dahlback and Garzarolli fails to teach stretching the sheet during heat treatment of the sheet in the α-phase temperature range of the alloy, as recited in claim 18 and also in claim 31.

Furthermore, neither Dahlback nor Garzarolli disclose, teach, or suggest carrying out the stretching and heat treatment in a continuous oven process, as recited in claims 18 and 31 as amended. Garzarolli in particular does not at all suggest or even allude to the possibility of carrying out the stretching during the heat treatment in a continuous oven process. Carrying out the stretching and heat treatment in a continuous oven process, as recited in the present invention, has several advantages. One advantage is that the use of any separate stretching bench or other apparatus becomes unnecessary. Also, this feature has the advantage that a desired growth of secondary phase particles can easily be obtained since the deformation caused by the stretching during the heat treatment in the oven leads to a considerably faster diffusion.

Moreover, Applicants respectfully submit that Dahlback is not properly combinable with Garzarolli and that a person skilled in the art would not look from one to the other as

alleged by the Examiner. The reason for this is that Dahlback concerns only a BWR (see Dahlback, column 1, lines 6-9), whereas Garzarolli is concerned only with a PWR (see Garzarolli, column 1, lines 16-17). As stated herein, different conditions and different designs pertain to the different types of nuclear reactors. For at least this reason, Dahlback and Garzarolli are not properly combinable.

Furthermore, Dahlback is concerned with obtaining a particular type of Widmanstatten structure (the basketweave structure) in a box wall for a fuel assembly for a BWR (Dahlback, column 2, line 66, to column 3, line 9). Garzarolli is not at all concerned with this problem. In fact, Garzarolli is not concerned with any plate structure at all. Instead, Garzarolli is concerned with the problem of radiation induced growth of guide tubes. As explained above, such guide tubes are characteristic of a PWR and do not form part of a fuel assembly for a BWR.

It should also be noted that the growth caused by neutron radiation is normally not a problem for a fuel assembly for a BWR if such a fuel assembly has gone through a suitable heat treatment. The sheets used for such a fuel assembly can, for example, experience a beta-quenching (as recited in the independent claims of the present application). By quenching in this manner, a randomized texture is obtained in the sheet. With such a randomized texture, the neutron radiation will not cause any particular growth in the longitudinal direction (since the texture is randomized, the growth will not appear in any particular direction; instead, any growth caused by neutron radiation will be equal in all directions, which means that the fuel assembly will not be particularly extended in the longitudinal direction).

In a PWR, on the other hand, the growth of the guide tubes in the longitudinal direction may cause particular problems as explained in Garzarolli. Since this is a problem specific to a PWR and since the BWR does not contain any such guide tubes, Garzarolli and Dahlback cannot be combined as suggested by the Examiner.

Because neither Dahlback nor Garzarolli disclose, teach, or suggest what Applicants recite in claims 18 and 31, namely, stretching the sheet during heat treatment of the sheet in the $\alpha$-phase temperature range of the alloy, both Dahlback and Garzarolli, individually and in combination, fail to teach all of the claim recitations of Applicants' invention. Also, because neither Dahlback nor Garzarolli disclose, teach, or suggest carrying out the stretching during the heat treatment in a continuous oven process, as recited in claims 18 and 31, both Dahlback and Garzarolli, individually and in combination, fail to teach all of the claim

recitations of Applicants' invention. Moreover, because Dahlback and Garzarolli are each drawn to disparate types of reactors, they are not properly combinable. Consequently, because not all of the claim recitations are taught by the cited references (individually and in combination) and because the references cited are not properly combinable, Applicants' claims 18 and 31 are necessarily non-obvious, and Applicants respectfully request that the Examiner withdraw the rejections of claims 18 and 31.

Claims that depend from a claim that is non-obvious are themselves necessarily non-obvious. Because claims 19-21 and 23 depend from claim 18, and because claim 18 is asserted to be non-obvious for the reasons presented above, claims 19-21 and 23 are necessarily non-obvious. Applicants, therefore, respectfully submit that claims 19-21 and 23 are allowable. Accordingly, Applicants respectfully request that the rejections of claims 19-21 and 23 be withdrawn.

Applicants believe that the foregoing amendments and remarks are fully responsive to the Office Action and that the claims herein are allowable. An early action to that effect is earnestly solicited.

If the Examiner believes that a telephone conference with Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is invited to telephone the undersigned.

Applicants believe that no fees are due with the submission of this Amendment. If any charges are incurred with respect to this Amendment, they may be charged to Deposit Account No. 503342 maintained by Applicants' attorneys.

Respectfully submitted,

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